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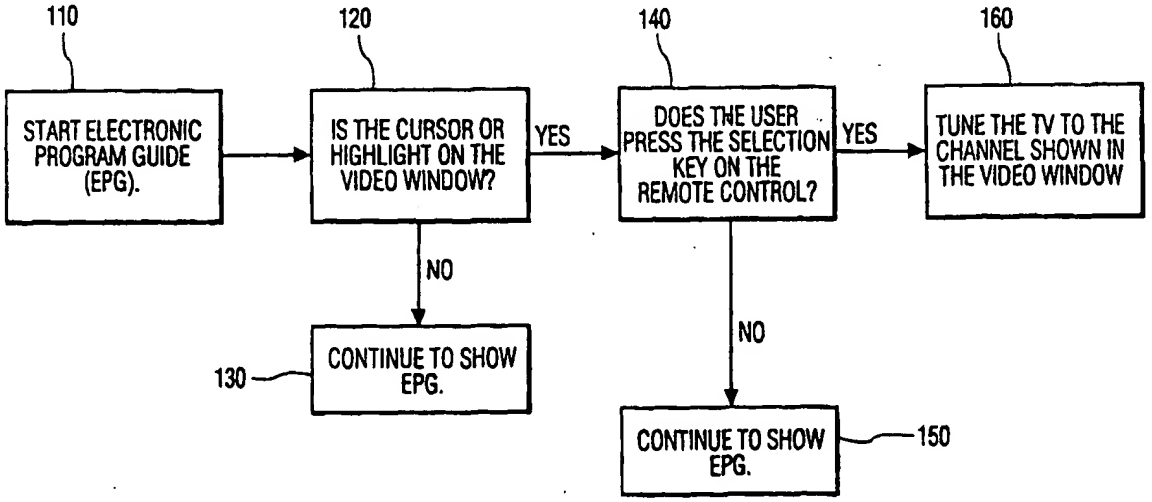

(57) Abstract

A video signal processing system and method provides a Picture-in-Guide (PiG) feature. An Electronic Program Guide (EPG) is displayed in a first image region of a display. The EPG comprises various selectable display areas ("News", "LANDS END"). In addition, a video image is shown in a second image region (210) of the display. The system includes user-selection means (325) for selecting the various display areas in the first image region and the second image region of the display. In response to the selection of the second image region of the display, a third image region appears on the display, replacing the first and the second image regions.

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PICTURE IN AN ELECTRONIC PROGRAM GUIDE FOR A VIDEO PROCESSING SYSTEM

The present invention relates to an electronic program guide (EPG) for a television system. An Electronic Program Guide (EPG) is an interactive, on-screen analog to TV listings found in local newspapers or other print media. The information contained in an EPG includes programming characteristics such as channel number, program title, start time, end time, elapsed time, time remaining, rating (if available), topic, theme, and a brief description of the program's content. EPGs are usually arranged in a two-dimensional table or grid format with time on one axis and channels on the other axis. Unlike non-interactive guides that reside on a dedicated channel and merely scroll through the current programming on the other channels, EPGs allow viewers to select, in advance, any channel at any time. Further EPG features include the ability to highlight individual cells of the grid containing program information. Once highlighted the viewer can perform functions pertaining to that selected program. For instance, a viewer could set up one touch video cassette recording (VCR) or the like if the television is properly configured and connected to a recording device. One example of an EPG system is the StarSight® system provided by StarSight Telecast, Inc. Aspects of the StarSight® system are described in US Pat. Nos. 5,353,121, 5,479,268, and 5,479,266 issued to Young et al. and assigned to StarSight Telecast, Inc.

One problem with EPG systems is that the EPG may occupy the complete screen and prevent a viewer from seeing any video programming while the EPG is active. As the number of available channels increases, a user may spend a significant amount of time searching through the EPG to find a program of interest. Therefore, a user may miss a significant portion of a currently selected program while using an EPG.

One solution is to provide an EPG display having a small window in which the currently selected video program is displayed. Displaying an image having one portion representing one video source and another portion representing another video source is well known.

Examples are picture-in-picture and picture-outside-picture systems, i.e., PIP and POP systems, respectively.

A problem associated with merely providing a PIP image in an EPG display is that while the user can see the video, the user may not recognize how to return to the channel being watched. For example, a user may search the EPG, find nothing of interest and wish to return to viewing the currently selected program.

In accordance with an aspect of the invention, a video signal processing apparatus is described for providing a Picture-in-Guide feature (referred to herein as PiG). The appratus comprises means for generating a signal suitable for coupling to a display device for producing a displayed image having a first image region and a second image region on the display. The first image region displays an electronic program guide having a plurality of display areas or screen elements, each of the display areas being selectable for selecting a respective program. The second image region displays a video image correspponding to a selected one of the display areas or screen elements of the first image region. The appratus further comprises means for selecting one of the second image region and one of the display areas of the first image region. The signal generating means responds to the selection said second image region by the selection means for replacing the first and second image regions with a third image region displaying said video image previously displayed in the second image region.

In accordance with another aspect of the invention, a method of processing an electronic program guide is described comprising the steps of:

displaying the electronic program guide containing a plurality of screen elements or display areas in a first region of a display, each of the screen elements representing a selectable program;

displaying a viewing window in a second region of the display when the electronic program guide is displayed in the first region of the display,

providing a user-selection device for selection of one of the screen elements in the electronic program guide and the window in the second region;

displaying in the window the program corresponding to the screen element selected by the user-selection device;

replacing the first and second regions of the display with a third region displaying the selected program being displayed in the window when the window is selected by the user-selection device.

In accordance with another aspect of the present invention, for example, when an EPG display having a PiG feature is active, video is displayed in a window portion of the EPG. The system includes means for moving a cursor within the EPG display. Suitable user-selection devices include a mouse or direction/selection keys on a remote control. A user selects the video window by first navigating the cursor such that the window is "highlighted" or such that the cursor indicates the window. The user then completes the selection process by clicking a mouse button or activating a selection button on a remote control. In response, the EPG is replaced by a full screen image of the video that was being displayed in the small window

In accordance with other aspects of the invention, the window included in the EPG display could display video other than that associated with a particular television channel. For example, the video displayed in the small window could be associated with a particular advertiser such as a pay-per-view promotion. Also, the video could be associated with a video game. In each case, selecting the small window would replace the EPG with a full screen display of the video content of the small window.

The described features may be better understood by referring to the accompanying drawing in which:

FIG. 1 shows a flow chart illustrating operation of a system incorporating principles of the invention;

FIG. 2 is a sample EPG display including windows displaying video;

FIG. 3 shows a television receiver embodying aspects of the invention.

FIG. 1 shows a flow chart illustrating the operation of an EPG system such as that shown in FIG. 2 and FIG. 3 and described below. In FIG. 1, an EPG is started at step 110 by, for example, pressing a particular key on a remote control. When activated, the EPG display appears in one image region of the display as shown in FIG. 2. In FIG. 2, a program guide

portion 200 of the EPG display indicates programs, channels, and program durations. In a second region of the display, a video window portion 210 shows video representing, for example, the currently selected program. A cursor represented by arrow 220 and/or highlighting represented by border 230 indicate that video window 210 is selected when positioned as shown in FIG. 2.

Returning to FIG. 1, step 110 is followed by step 120 which tests the current location of the cursor to determine if the cursor is positioned to indicate selection of the video window portion of an EPG display, e.g., by being in close proximity to and pointing to the video window as in FIG. 2 or by being superimposed on the video window. If so, step 120 produces a "yes" result. Alternatively, or in conjunction with testing the cursor position, step 120 can test the location of highlighting such as highlighting the border 230 in FIG. 2. If the video window is highlighted, a "yes" result is produced at step 120. A "yes" result at step 120 causes step 120 to be followed by step 140. If the result of the test at step 120 is "no", i.e., the cursor and/or highlighting does not indicate the selection of the video window, display of the EPG continues as shown by step 130.

At step 140, the system tests to determine whether the user has activated a selection key, e.g., on a remote control. If not, EPG display continues at step 150. If the result at step 140 is "yes", the video window has been selected and step 140 is followed by step 160. At step 160, the television receiver is tuned to the channel shown in the video window. A third region, for example, the full screen, may display the tuned video signal, replacing both the EPG and the small window on the display

FIG. 3 shows a television receiver suitable for providing the features illustrated in FIG. 1 and FIG. 2. The system shown in FIG. 3 has a first input 300 for receiving television signal RF_IN at RF frequencies and a second input 302 for receiving baseband television signal VIDEO IN. Signal RF_IN may be supplied from a source such as an antenna or cable system while signal VIDEO IN may be supplied, for example, by a video cassette recorder (VCR). Tuner 305 and IF processor 330 operate in a conventional manner for tuning and demodulating a particular television signal that is included in signal RF_IN. IF processor 330 produces baseband video signal VIDEO representing the video program portion of

the tuned television signal. IF processor 330 also produces a baseband audio signal that is coupled to an audio processing section (not shown in FIG. 3) for further audio processing. Although FIG. 3 shows input 302 as a baseband signal, the television receiver could include a second tuner and IF processor similar to units 305 and 330 for producing a second baseband video signal from either signal RF_IN or from a second RF signal source.

The system shown in FIG. 3 also includes a main microprocessor (μP) 310 for controlling components of the television receiver such as tuner 305, picture-in-picture processing unit 340, video signal processor 355, and StarSight® data processing module 360. As used herein, the term "microprocessor" represents various devices including, but not limited to, microprocessors, microcomputers, microcontrollers and controllers. Microprocessor 310 controls the system by sending and receiving both commands and data via serial data bus I^2C BUS which utilizes the well-known I^2C serial data bus protocol. More specifically, central processing unit (CPU) 312 within μP 310 executes control programs contained within memory, such as EEPROM 327 shown in FIG. 3, in response to commands provided by a user, e.g., via IR remote control 325 and IR receiver 322. For example, activation of a "CHANNEL UP" feature on remote control 325 causes CPU 312 to send a "change channel" command along with channel data to tuner 305 via I^2C BUS. As a result, tuner 305 tunes the next channel in the channel scan list. Another example of a control program stored in EEPROM 327 is software for implementing the operations shown in FIG. 1.

CPU 312 controls functions included within μP 310 via bus 319 within μP 310. In particular, CPU 312 controls auxiliary data processor 315 and on-screen display (OSD) processor 317. Auxiliary data processor 315 extracts auxiliary data such as StarSight® data from video signal PIPV.

StarSight® data is typically received only on a particular television channel and the television receiver must tune that channel to extract StarSight® data. To prevent StarSight® data extraction from interfering with normal use of the television receiver, CPU 312 initiates StarSight® data extraction by tuning the particular channel only during a

time period when the television receiver is usually not in use (e.g., 2:00 AM). At that time, CPU 312 configures decoder 315 such that auxiliary data is extracted from horizontal line intervals such as line 16 that are used for StarSight® data. CPU 312 controls the transfer of extracted StarSight® data from decoder 315 via I^2C BUS to StarSight® module 360. A processor internal to the module formats and stores the data in memory within the module. In response to the StarSight® EPG display being activated (e.g., a user activating a particular key on remote control 325), CPU 312 transfers formatted StarSight® EPG display data from StarSight® module 360 via I^2C BUS to OSD processor 317.

OSD processor 317 operates in a conventional manner to produce R, G, and B video signals OSD_RGB that, when coupled to a display device, will produce a displayed image representing on-screen display information such as graphics and/or text comprising an EPG. OSD processor 317 also produces control signal FSW which is intended to control a fast switch for inserting signals OSD_RGB into the system's video output signal at times when an on-screen display is to be displayed. For example, when a user enables an EPG, e.g., by activating a particular switch on remote control 325, CPU 312 enables processors 315 and 317 so that processor 315 extracts the closed caption data from line 21 intervals of video signal PIPV. Processor 317 produces signals OSD_RGB representing the closed caption data. Processor 317 also produces signal FSW indicating when the caption is to be displayed.

Video signal processor (VSP) 355 performs conventional video signal processing functions, such as luma and chroma processing. Output signals produced by VSP 355 are suitable for coupling to a display device, e.g., a kinescope or LCD device (not shown in FIG. 3), for producing a displayed image. VSP 355 also includes a fast switch for coupling signals produced by OSD processor 317 to the output video signal path at times when graphics and/or text is to be included in the displayed image. The fast switch is controlled by control signal FSW which is generated by OSD processor 317 in main microprocessor 310 at times when text and/or graphics are to be displayed.

The input signal for VSP 355 is signal PIPV that is output by picture-in-picture (PIP) unit 340. When a user activates PIP mode, signal

PIPV represents a large picture (large pix) into which a small picture (small pix) is inset. When PIP mode is inactive, signal PIPV represents just the large pix, i.e., no small pix signal is included in signal PIPV. The described operation of PIP unit 340 is provided by features of PIP unit 340 including video switch 342, I^2C interface 341, PIP processor 344 and RAM 345. Switch 342 operates under user control for determining the coupling of the two input video signals VIDEO and VIDEO IN to the large and small pix signals LPIXV and SPIXV within PIP unit 340. Typically, switch 342 couples signal VIDEO to signal LPIXV and couples signal VIDEO IN to signal SPIXV, but switch 342 can swap the connections or couple one input signal to both the large and small picture signal lines. I^2C interface 341 provides a bi-directional control and data interface between the I^2C BUS and the functions within PIP unit 340. Thus, main μP 310 can control the operation of switch 342 and PIP processor 344 via the I^2C BUS.

When PIP processing is activated, PIP processor 344 implements the PIP function in a conventional manner. Briefly, PIP processor 344 converts signal SPIXV to digital data via analog-to-digital converters (ADC) that are included in PIP processor 344. The digital data is subsampled to reduce the amount of data and to reduce the size of the small picture image that is displayed. The subsampled data is stored in RAM 345 until the small picture display interval at which time the stored small-picture data is read from RAM 345 and converted into an analog small picture signal via digital-to-analog converters (DAC) that are included in PIP processor 344. A switch included in PIP processor 344 includes the analog small picture signal in signal PIPV during the small picture display interval.

The small picture generation capabilities of PIP processor 344 are also used to generate the small video image included in the EPG display, e.g., video image 210 in FIG. 2. However, for an EPG display, the main or large picture is produced by OSD processor 317 and included in the output signal by VSP 355 in response to fast switch signal FSW, rather than including the large picture video signal LPIXV. Thus, when controller 310 detects activation of the EPG display, e.g., when a user presses the appropriate key on remote control 325, controller 310 causes OSD processor 317 to produce the EPG display using StarSight® EPG data

from StarSight® module 360. Controller 310 also causes PIP processor 340 to produce a small video image from the currently selected main video signal. VSP 355 combines the EPG display data and the small video image signal in response to signal FSW to produce the display in FIG. 2.

When the EPG display is active, controller 310 executes a control program stored in EEPROM 327. The control program monitors the location of a position indicator, such as a cursor and/or highlighting, in the EPG display in accordance with the flowchart in FIG. 1. A user controls the location of the position indicator using direction and selection keys of remote control 325. Alternatively, the system could include a mouse device.

Suitable components for implemeting the features of the system shown in FIG. 3 that have been described thus far comprises an ST9296 microprocessor produced by SGS-Thomson Microelectronics for providing the features associated with μP 310; an M65616 picture-in-picture processor produced by Mitsubishi for providing the described basic PIP functionality associated with PIP processor 340; and an LA7612 video signal processor produced by Sanyo or providing the functions of VSP 355.

It is to be understood that the embodiments and variations shown and described herein are for illustrations only and that various modifications may be implemented by those skilled in the art without departing from the scope and spirit of the invention.

CLAIMS

1. Apparatus comprising:

means (310. 340, 360) for generating a signal suitable for coupling to a display device for producing a displayed image having a first image region and a second image region (210); said first image region displaying an electronic program guide having a plurality of display areas("News", "LANDS END"), each of said display areas being selectable for selecting a respective program; said second image region displaying a video image correspponding to a selected one of said display areas of said first image region; and

means (325) for selecting one of said second image region and one of said display areas of said first image region; said signal generating means being responsive to selection said second image region by said selection means for replacing said first and second image regions with a third image region displaying said video image previously displayed in said second image region.

2. The apparatus of claim 1 wherein said apparatus further comprising means (310, 220) for highlighting said second image region when said second image region is being selected.

3. The apparatus of claim 2 wherein said apparatus further comprising means (310, 220) for highlighting said one of said display areas when said one of said display areas is being selected.

4. The apparautus of claim 1, wherein said apparatus further comprises a cursor (220) on said display, said cursor being controlled by said selecting means (325).

5. The apparatus of claim 4 wherein said signal generating means (310. 340, 360) replaces said first and second image regions with said third image region displaying said video image previously displayed in said second image region, in response to said cursor (220) being moved to said second image region and a key being activated on said selecting means (325).

6. The apparatus of claim 5, wherein said selection of said one of said display areas of said first image region is accomplished by moving said cursor to said one of said display areas and activating a key on said selecting means.

7. The apparatus of claim 1 wherein one of said display areas corresponds to a label for a video game.

8. The aparatus of claim 1 wherein one of said display areas corresponds to a label for an advertisement.

9. A method of processing an electronic program guide comprising the steps of:

displaying said electronic program guide containing a plurality of screen elements ("News", "LANDS END") in a first region of a display (DISPLAY), each of said screen elements representing a selectable program;

displaying a viewing window (210) in a second region of said display when said electronic program guide is displayed in said first region of said display,

providing a user-selection device (322) for selection of one of said screen elements in said electronic program guide and said window in said second region;

displaying in said window said program corresponding to said screen element selected by said user-selection device;

replacing said first and second regions of said display with a third region displaying said selected program being displayed in said window when said window is selected by said user-selection device.

10. The method of claim 9 wherein said method further comprising the step of highlighting said window when said window is being selected.

11. The method of claim 10 wherein said method further comprising the step of highlighting said selected screen element when said screen element is being selected.

12. The method of claim 9, wherein said selection of said window is accomplished by moving a cursor (220) to said window on said display with said user-selection device, and activating a key on said user-selection device.

13. The method of claim 12, wherein said selection of said screen element is accomplished by moving said cursor to said screen element and activating a key on said user-selection device.

14. The method of claim 9 wherein said selected program is a video game.

15. The method of claim 9 wherein said selected program is an advertisement.

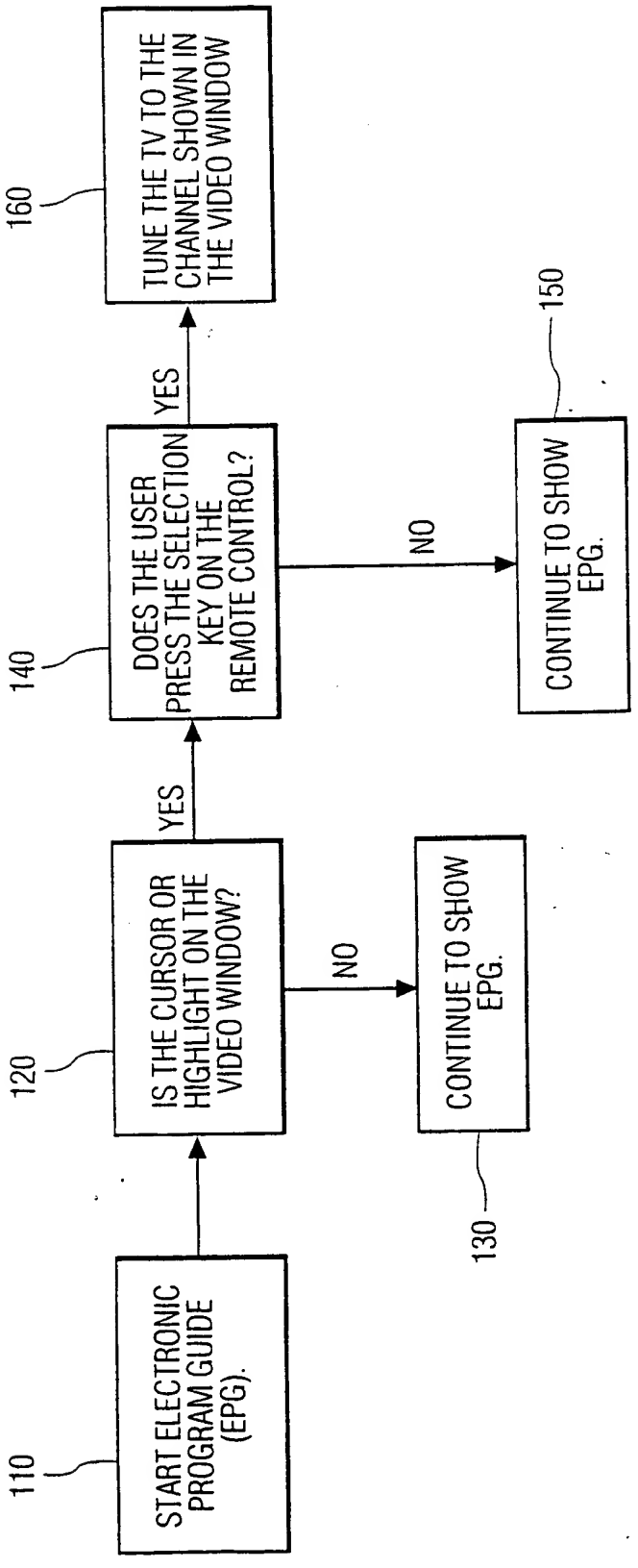
START ELECTRONIC PROGRAM GUIDE (EPG).
110
IS THE CURSOR OR HIGHLIGHT ON THE VIDEO WINDOW?
120
YES
NO
CONTINUE TO SHOW EPG.
130
DOES THE USER PRESS THE SELECTION KEY ON THE REMOTE CONTROL?
140
YES
NO
CONTINUE TO SHOW EPG.
150
TUNE THE TV TO THE CHANNEL SHOWN IN THE VIDEO WINDOW
160

FIG. 1

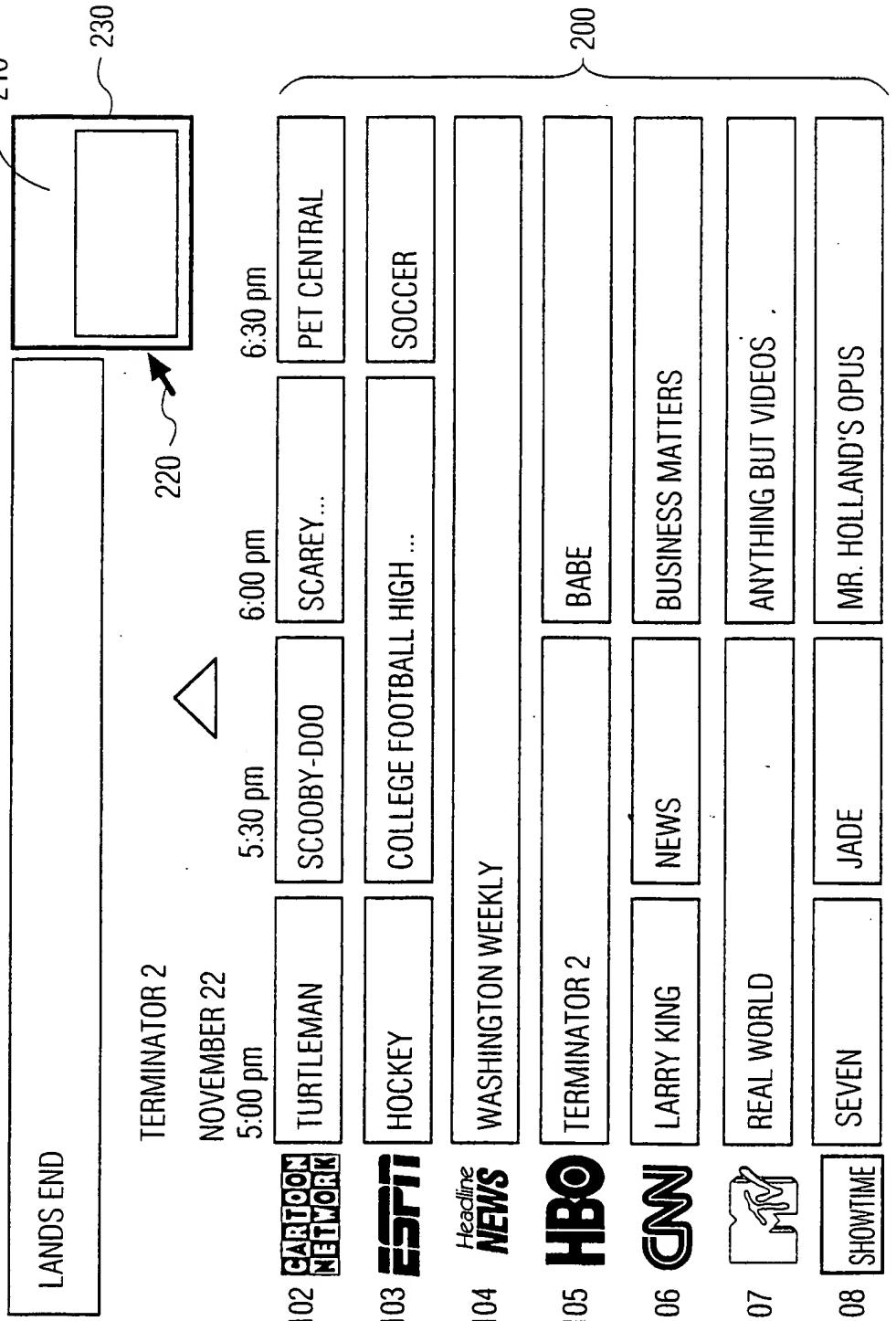
LANDS END
TERMINATOR 2
NOVEMBER 22
5:00 pm
5:30 pm
6:00 pm
6:30 pm
210
220
230
200
102 CARTOON NETWORK
TURTLEMAN
SCOOBY-DOO
SCAREY...
PET CENTRAL
103 ESPN
HOCKEY
COLLEGE FOOTBALL HIGH ...
SOCCER
104 Headline NEWS
WASHINGTON WEEKLY
105 HBO
TERMINATOR 2
BABE
106 CNN
LARRY KING
NEWS
BUSINESS MATTERS
107 MTV
REAL WORLD
ANYTHING BUT VIDEOS
108 SHOWTIME
SEVEN
JADE
MR. HOLLAND'S OPUS
GO BACK
HELP
NOW
SETUP

FIG. 2

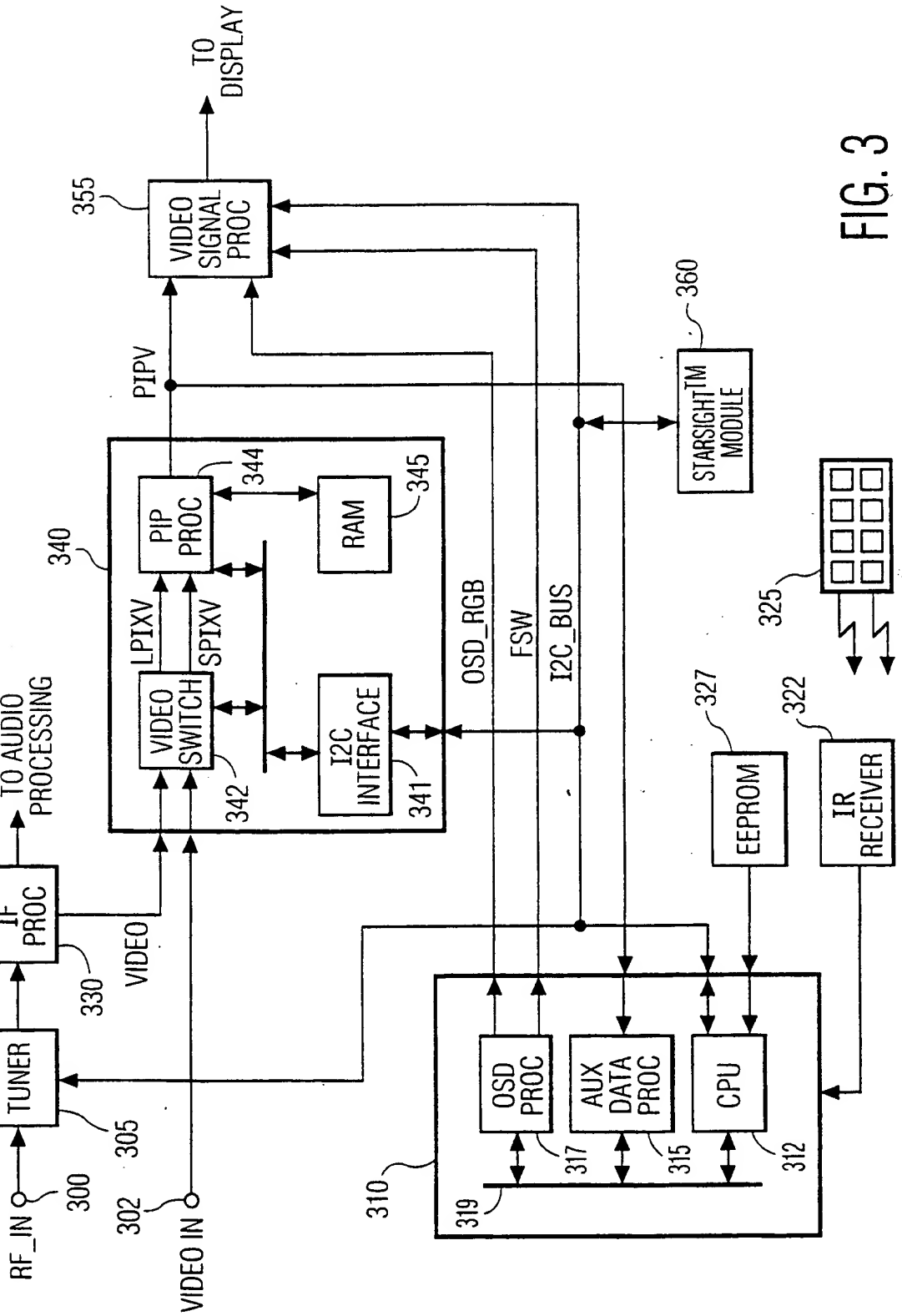
TO DISPLAY
355
VIDEO SIGNAL PROC
360
STARSIGHT™ MODULE
PIPV
340
PIP PROC
344
RAM
345
LPIXV
SPIXV
VIDEO SWITCH
342
I2C INTERFACE
341
OSD_RGB
FSW
I2C_BUS
325
TO AUDIO PROCESSING
IF PROC
330
VIDEO
327
EEPROM
322
IR RECEIVER
TUNER
305
OSD PROC
317
AUX DATA PROC
315
CPU
312
310
319
RF_IN
300
302
VIDEO IN

FIG. 3

INTERNATIONAL SEARCH REPORT

Inte onal Application No
PCT/US 97/22842

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N5/45

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category ˜	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 97 34413 A (GUIDE INC E ;YUEN HENRY C (US); MANKOVITZ ROY J (US); KWOH DANIEL) 18 September 1997 see the whole document ---	1,9
A	EP 0 735 750 A (SAMSUNG ELECTRONICS CO LTD) 2 October 1996 see the whole document -----	1,9

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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1

Date of the actual completion of the international search
8 April 1998

Date of mailing of the international search report
28/04/1998

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Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte. onal Application No
PCT/US 97/22842

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9734413 A	18-09-97	AU 2212497 A	01-10-97
		AU 2330597 A	01-10-97
		WO 9734414 A	18-09-97
EP 0735750 A	02-10-96	JP 8289269 A	01-11-96